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Self-Reported Usual Care for Self-Directed Violence during the Six Months Prior to Emergency Department Admission

Katherine Anne Comtois, PhD, MPH, **Amanda H. Kerbrat, MSW**,
Department of Psychiatry & Behavioral Sciences, Harborview Medical Center, Box 359911, 325 9th Ave, Seattle, WA 98104, 206-744-1716 (office) 206-744-9939 (fax)

David C. Atkins, PhD,
Center for the Study of Health and Risk Behaviors, Department of Psychiatry and Behavioral Sciences, University of Washington, 1100 NE 45th Street, Suite 300, Seattle, WA 98105, 206-616-3879 (office) 206-744-3231 (fax)

Peter Roy-Byrne, MD, and
Department of Psychiatry & Behavioral Sciences, Harborview Medical Center, Box 359911, 325 9th Ave, Seattle, WA 98104, 206-897-4201 (office) 206-744-3231 (fax)

Wayne J. Katon, MD
Department of Psychiatry & Behavioral Sciences, University of Washington, Box 356560, Seattle, WA 98195, 206-543-7177 (office) 206-221-5414 (fax)

Amanda H. Kerbrat: ahm2@uw.edu; David C. Atkins: datkins@uw.edu; Peter Roy-Byrne: roybyrne@uw.edu; Wayne J. Katon: wkaton@uw.edu

Abstract

Background—The literature describing the health services individuals receive prior to and following self-directed violence is limited.

Objectives—This study examines services received for the six months preceding admission to an urban county medical center emergency department for self-directed violence. We predicted that individuals with at least one prior act of self-directed violence in the past six months would have received more services than those for whom the index admission was their only recent act.

Method—Participants were recruited from emergency department admissions during shifts selected to maximize representativeness. Participants (n=202) were interviewed using the Suicide Attempt Self-Injury Interview, Suicide Attempt Self-Injury Count, Treatment History Interview, MINI, Brief Symptom Index, and SF-12.

Results—The majority of index acts of self-directed violence (79%) were suicide attempts. The participants were characterized by low socio-economic status, substantial symptomatology, low physical and mental health functioning, and multiple psychiatric diagnoses. In the preceding six months, 34% were admitted to a hospital and 56% received crisis services (including 44% in the ED). While three quarters (76%) had seen an outpatient medical provider and most (70%) received psychotropic medications, less than half of the sample received psychiatric services (40%) or

Corresponding author: Kate Comtois, PhD, MPH, Department of Psychiatry & Behavioral Sciences, Harborview Medical Center, Box 359911, 325 9th Ave, Seattle, WA 98104, 206-897-4225 (phone) 206-744-3231 (fax), comtois@uw.edu.

outpatient psychosocial treatment (48%). As predicted, utilization for most types of usual care was higher for those engaging in self-directed violence in the six months preceding the index admission.

Conclusions—Individuals admitted to this emergency department for self-directed violence received inadequate outpatient psychosocial and psychiatric services despite severe illness and disability.

Keywords

suicide attempt; self-directed violence; emergency; health services; quality of care

Suicide remains a staggering public health burden in the US. In 2010, over 38,000 deaths by suicide occurred – one suicide every 14 minutes and more than two suicides for every homicide[1]. Self-directed violence (SDV), as defined by the Centers for Disease Control and Prevention[2] and utilized by the Departments of Defense and Veterans Affairs[3,4], incorporates suicide attempts and non-suicidal self-directed violence as well as death by suicide. In 2012, 483,596 people were treated in emergency departments (EDs) for SDV (primarily suicide attempts); 68.8% of whom were hospitalized due to SDV[5]. In 2000, the cost of SDV was $33 billion, including $1 billion for medical treatment and $32 billion in lost productivity[6]. While suicide prevention efforts have focused on youth and older adults, the most recent CDC mortality data from 1999-2010 in the US show a 28% increase in suicide rates among middle-aged adults[7].

For all these reasons, reducing death by suicide and SDV more generally is a health care priority.[8,9] Yet very little is known about the type and quantity of usual care suicidal individuals receive – particularly those admitted to the Emergency Department (ED). Admission to the ED is a strong predictor of future suicide death[10,11] and suicidal individuals represented 1.7% of all ED admissions in a recent survey[12]. From 1993-2008, the average number of ED visits for SDV more than doubled and the rate per 1,000 people almost doubled for males, females, whites, and blacks[13]. Individuals admitted to the ED due to SDV have higher rates of return ED visits (232.7 visits per 100 person-years) than individuals presenting with asthma (117.6 visits) and other health concerns (83.0 visits)[14] with a third admitted to the hospital, and a quarter transferred to another facility[14]. Thus, the ED is a critical entry point for suicidal individuals with the healthcare system, though little is known about the health services these individuals receive.

Most research has evaluated services received prior to suicide deaths. A review of 40 studies[15] found 45% and 77% of individuals who died by suicide attended primary care in the month and year before their deaths. However, only 19% received inpatient or outpatient mental health services in the prior month, 32% in the prior year, and 53% lifetime[15]. Little research has examined services leading to or following ED admission for self-directed violence (SDV)[16]. ED directors surveyed in California found their main concern for their suicidal patients was the lack of available community services[12]. Only one study in Finland evaluated the quality of care for SDV and found inadequate depression pharmacotherapy, psychotherapy, and ECT[17] and inadequate alcohol treatment[18] in the month prior and following an ED admission. Studies of individuals with multiple compared to single

episodes of SDV find multiple episodes are associated with more use of services including inpatient psychiatric admission, inpatient length-of-stay, outpatient psychiatric services, outpatient psychotherapy, and psychiatric medications[19–22].

Thus, health services studies of usual care for suicidal individuals admitted to the ED have been limited in both detail and scope and present a complex picture. The present study was designed as a detailed, descriptive examination of multiple types of usual medical, psychosocial, and pharmacotherapy services received in the six months prior to an ED admission for SDV. Based on previous research, we predicted that individuals reporting SDV in the six months preceding the ED admission would have received more inpatient, crisis, and outpatient health services than those for whom the index ED admission was the only six-month episode of SDV.

Methods

Participants

Participants were consecutively recruited from all admissions to the medical/surgical and psychiatric emergency services of XXX (HMC) between 2003 and 2005 during assessment periods selected to maximize representativeness. HMC is the county-owned hospital serving XXX and XXX and is the medical center that receives patients from law enforcement and emergency dispatch as well as those without means to pay.

Study interviewers were extensively trained on all measures as well as on suicide risk management and the ethics of research with high-risk patients in the ED setting. Interviewers were scheduled for recruitment periods from 12:00am to 8:00am, 8:00am to 4:00pm, and 4:00pm to 12:00am. Recruitment periods were selected to equally represent times of day, days of the week, and months of the year, although, we replaced the overnight shift with a second 4:00pm to 12:00am shift, because almost all patients were intoxicated, sleeping, or unwilling to be interviewed overnight.

During each recruitment period, all injuries likely to be self-directed violence (e.g., motor vehicle accidents, falls, lacerations, overdoses) were reviewed with clinical staff to determine if it was possible they were self-inflicted. Medical/surgical patients with injuries that were possibly SDV and all patients in the psychiatric emergency department were considered for the study if they were between 18-60 years of age. Potential participants with any of the following criteria were excluded: (a) not from local county, (b) did not speak English sufficiently to consent or be interviewed, (c) symptoms of psychosis, dementia, confusion, or other cognitive impairment were too severe for informed consent or to be interviewed, (d) was an inmate or under arrest, (e) was too aggressive to be interviewed, or (f) determined clinically inappropriate by an ED clinician.

Following informed consent, a screening interview included the Suicide Attempt Self-Injury Interview (SASII)[23] to standardize determination of SDV generally and whether the participant had intended to die. Of the 202 study participants, the index admission of 160 (79%) was for a suicide attempt; the remaining 42 (21%) was for non-suicidal SDV (See Figure 1 Flowchart of Study Recruitment and Completion).

Measures

The SASII[23] assesses a single act of SDV in detail, in this case the act resulting in ED admission. The SASII was used to determine whether the SDV was a suicide attempt or non-suicidal SDV. Excellent inter-rater reliability (ICCs .871–.978) and validity compared to medical records, therapist notes, and patient self-monitoring has been demonstrated for the SASII[26]. The Suicide Attempt and Self-Injury Count (SASI-Count[24,25]) is a short form of the SASII that efficiently assesses all SDV acts during a specified time period, in this case, the past six months and lifetime. The SASI-Count determines method, suicide intent, lethality, and medical treatment received for suicide attempts and non-suicidal SDV. The Mini International Neuropsychiatric Interview (MINI[26–28]) was used as a brief diagnostic measure because the context of the ED precluded the use of a full diagnostic measure like the SCID-P. The MINI has excellent inter-rater reliability[26,27] but only moderate concordance with the SCID-P[27] and CIDI[28]. The MINI assesses current mood episodes, current anxiety and eating disorders, current psychotic disorder (MINI does not differentiate between psychotic diagnoses), current psychoactive substance use disorders (past 12 months), and lifetime antisocial personality disorder. The presence or absence of lifetime borderline personality disorder was determined via the Structured Clinical Interview for DSM-IV, Axis II (SCID-II[29–31]). Overall adjustment and symptomatology was measured by the Brief Symptom Inventory (BSI[32–34]). The Short-Form Health Survey (SF-12[35–37]) assessed functional status.

The Treatment History Interview (THI[38]) describes (1) the participant's involvement with professional psychotherapy, comprehensive treatment programs, substance abuse programs, case management, self-help groups, and other non-professional forms of treatment; (2) involvement with inpatient units, crisis services, and outpatient psychiatric and medical treatment, and (3) medications prescribed, dates of use, and estimates of compliance.

Analyses of previous THI data have demonstrated its validity[38]. Participant self-report of psychiatric admissions and days were compared with medical records, revealing 90% agreement between participant report and hospital records for number of admissions per participant and 80% agreement for number of days per participant. In a clinical trial of Dialectical Behavior Therapy, all reports of individual psychotherapy were verified by calling psychotherapists for interviews. There were no false positives. Comparison between therapists' records of therapy hours and self-reported therapy hours yielded no significant difference. To maximize validity in the study described here, releases of information were obtained for all self-reported health services and these medical records sought. Available records were used to clarify and supplement unclear or missing participant responses.

Procedure

Participants were interviewed during the hospital admission – either in the ED or on a medical, surgical, or psychiatric unit. Interviews were divided into sessions if participants were distressed or fatigued, to assure treatment was provided without delay, and for transfers to other units. If discharged prior to completion of the interview, participants were interviewed up to one week following discharge. Assessments were prioritized so critical measures of suicidal behavior and health services occurred first with diagnostic and self-

report measures last in case the full interview could not be completed. Participants were compensated $25 for the interview, which took a median of 1 hour (IQR=1-2). The University of Washington Risk Assessment Protocol (UWRAP) was utilized to manage risk during the assessments. This protocol has been recommended by NIMH[39] and has been used successfully in over 20 years of research by the PI and others[40,41]. All measures were checked by lead research staff for accuracy, reliability of ratings, and consistency within and between measures. All procedures were reviewed and approved by the XXX Institutional Review Board.

Statistical Analysis

To describe health services use, descriptive statistics were tabulated for the type and quantity of medical, crisis, outpatient, and pharmacotherapy services and compared by six-month SDV status (single versus multiple SDV episodes). Logistic, negative binomial, or linear regression models were used, for binary, count, or continuous outcomes, respectively. For several count outcomes, a two-part hurdle model was used due to large presence of zeroes[42]. Some logistic regression models had very small cell sizes, leading to a problem known as partial separation in logistic regression[43] in which odds ratios and 95% CI become extreme and biased. Accordingly, we utilized a Bayesian approach to logistic regression in which a prior distribution is placed on the coefficients, restricting them from going to extreme values[44]. R software (version 3.0.0[45]) was used for all analyses, and the bayesglm function in the arm package[46] was used for the Bayesian analyses.

Results

Table 1 provides the demographic and clinical description of the full sample categorized by six-month SDV status. Participants were in mid-adulthood, roughly equal in gender, predominantly Caucasian, largely single, and evenly divided between those with a high school education or less and those with at least some college education. Most were unemployed and low-income, and a quarter were homeless. Compared to a representative sample of patients (SDV and non-SDV) in the XX psychiatric emergency service (PES)[47], this sample was almost exactly the same for gender, age, ethnicity and homelessness. However, compared to [City] census data the study sample has a lower percentage of African-Americans (7.9%), and mixed race (5.1%) and a higher percentage Asian and Pacific Islander (14.2%).[48] Median household income in [City] is $63,470, whereas 75% of the study sample reported incomes below $20,000. City homelessness is 1.4% compared to the 25% in this sample.[49] Those who refused assent (n=83) were slightly yet significantly younger (M=32.3 years, SD=10.0) than those who assented (M=36.2 years, SD=10.9; n=282, t(362)=2.91, p=.004). Those who refused did not differ in gender, the presence of suicidal ideation, positive blood alcohol or urine toxicology screen, or being restrained during their admission.

As seen in Table 1, participants with multiple SDV episodes were generally comparable to those with a single SDV in the previous six months, but were younger and more likely to be single and homeless. The sample as a whole had a median of two previous suicide attempts (lifetime), but among those with multiple SDV episodes, there was a median of six previous

lifetime suicide attempts. Non-suicidal SDV differed between groups with a median of zero in the full sample and one among those with multiple SDV episodes.

Also shown in Table 1, the sample screened positive for multiple psychiatric diagnoses with over 90% reporting an affective episode and over 80% reporting at least one current anxiety disorder. Over 40% met criteria for a substance use disorder and 30% reported psychotic symptoms. Almost a quarter met criteria on the MINI for antisocial personality disorder and 29% met criteria for borderline personality disorder on the SCID-II. Global severity index (GSI) scores on the BSI questionnaire indicated substantial symptomatology. Both physical and mental health functioning scores on the SF-12 were not only well below their age norms, but also below a sample of those with clinical depression[35,36]. However, only the GSI measure of symptomatology was associated with SDV subgroups – with greater psychiatric symptomatology in those with multiple SDV in the past six months.

Table 2 illustrates the range of inpatient and crisis services received for behavioral health reasons in the six months preceding index ED admission. A third (34%) had at least one medical, psychiatric, or substance abuse inpatient admission, with a quarter admitted to an inpatient psychiatric unit—largely voluntarily. Fifty-six percent had received a crisis service: almost half in an ED for behavioral health reasons, and over a quarter from paramedics. As expected, those with multiple SDV episodes used significantly more inpatient and crisis services.

Table 3 presents medical and pharmacotherapy visits. Less than half the participants (41%) received at least one outpatient visit with a medical or psychiatric professional for behavioral health reasons, i.e., for suicidality, psychiatric symptoms, substance abuse, or psychiatric medications. This did not differ between groups. Over two-thirds of the sample were prescribed, and took, a psychotropic medication with those with a single SDV episode less likely to take any medication than those with multiple SDV episodes (60% vs. 80%). Moreover, there were significantly more medications taken by individuals with multiple SDV episodes (Mdn = 3) vs. those with a single SDV episode (Mdn = 2).

Table 4 shows the frequency and types of outpatient psychosocial services received by participants in the previous six months. Less than half had received outpatient psychosocial services, with large variation in the number of sessions received. Modal services received were individual therapy and case management. Few (10%) reported formal substance abuse treatment and slightly less than a quarter reported attending twelve-step meetings (although 40% met substance abuse or dependence in past 12 months). Average satisfaction with psychosocial services was almost 4 on a 5-point scale. As expected, the participants with multiple SDV episodes were twice as likely to have received outpatient psychosocial services than those for whom the ED admission was the single SDV episode. However, among those who received these services, there was not a significant difference in the amount of services received and the only treatment modality that differed was that case management was received by more of the multiple SDV participants.

Discussion

This examination of usual care medical, psychosocial, and pharmacotherapy services received in the six months prior to an ED admission for SDV paints a sobering picture of the physical and mental health of patients and the services they receive. The participants in this sample were quite ill, with substantial symptomatology, poor physical and mental health, and multiple diagnoses. Despite this, the majority never received outpatient psychosocial or psychiatric services in the six months prior to the index ED admission for SDV. Despite diagnoses of affective disorder in 90% and anxiety disorder in 80%, a third had not received any psychotropic medication and none had received ECT or rTMS. While two thirds were taking psychotropic medication, in the previous six months less than half reported a visit with a psychiatric or medical provider in which any behavioral health concern was addressed. Thus, as seen in Suominen's quality of care studies[17,18], these patients were under-treated.

Consistent with previous studies, approximately a quarter had been admitted to a psychiatric unit in the previous six months – slightly more than the 20% found by Runeson & Wasserman[16] in Sweden, the only other study examining a six-month window. Almost half (48%) received at least one outpatient psychosocial service and 41% at least one behavioral health medical visit in the previous six months, also similar to the 43% found by Runeson & Wasserman. Three quarters (76%) had seen a physician, nurse, or other outpatient medical provider in the previous six months, twice the rate reported by Runeson & Wasserman[16].

We hypothesized that the quantity of health services would be higher for those who had harmed themselves multiple times because this may have led them to seek services or be recommended for them (although not all SDV episodes were treated)[19–22]. Higher utilization among participants with multiple SDV episodes was seen for almost every crisis service including inpatient and ED admissions, as well as whether they received outpatient psychosocial treatment or were taking psychotropic medications. However, multiple SDV episodes were not associated with amount of psychosocial treatment nor rates of medical or psychiatric visits, individual therapy, group therapy, or any type of substance abuse treatment. However, multiple episodes were associated with higher use of case management services. This may reflect a bias in publicly funded services in XX state toward psychotropic medications and case management over other forms of treatment.

While almost two-thirds of the sample had an alcohol or substance abuse or dependence diagnosis on the MINI, very few had received appropriate services. Ten percent had been to a residential drug or alcohol program and 10% to outpatient substance abuse treatment – comparable with the 11% who went to a detoxification center, which is a very short-term crisis response to substance dependence. Only one in seven participants received any of these three types of substance abuse treatment, and less than a quarter had attended a twelve-step meeting during the previous six months. Thus, substance abuse was drastically under-treated in this sample as was found in the previous study by Suominen[18].

These results have several clinical implications. Few SDV patients are receiving outpatient behavioral health treatment, particularly psychotherapy, which has the strongest empirical

support in preventing future suicide attempts.[50–55] Conversely, pharmacotherapy and case management, which have little empirical support in preventing suicidal behavior[54,55], were much more common. These results emphasize the need for medical/surgical services to screen for SDV and suicidal ideation and make clear discharge referrals for appropriate behavioral health care. While access to care is often limited[12], a clear referral for a type of service (e.g., psychotherapy), increases the chances it will be followed by the patient, family, or primary care clinician.

This study also highlights the lack of substance abuse treatment for those with addictions. It is also imperative that suicidal individuals with substance abuse and dependence have access to treatment – both substance abuse and mental health services.[56,57] Substance abuse treatment providers are often not credentialed to address suicidal behavior and therefore refer patients to the ED. Since addiction is such a critical risk factor for suicide, integration of mental health resources for suicide risk, management, and treatment into outpatient services rather than relying on the ED is critical.[57]

There were important limitations to this study. First, this study was conducted at one publicly funded medical center in an urban XXX community, which will not be representative of all suicidal ED patients – especially in XXX county where the median income is $70,000, high school and college graduation rates are 92% and 46% respectively, and only 11% of the population is below the poverty line. In this sample, 85% graduated high school but only 14% graduated college and over half were under the poverty line of $10,000/year. Thus, this sample represents a very low-income subgroup. It is unclear whether they were always in this situation or whether their illness(es) led to social drift to poverty and disadvantage.

Second, not all participants approached by the study participated or completed the entire interview as shown in Figure 1. However, all admissions in the assessment windows chosen to maximize representativeness were tracked for recruitment. Third, information was provided retrospectively by participant report. Services and especially diagnostic information may have been missed or reported inaccurately. Standardized measures with demonstrated validity, well-trained interviewers, and clarification with medical records (when available) were used to mitigate this limitation. Finally, the lack of previous research on health service utilization among suicidal individuals limited hypotheses to guide study predictions, which therefore were made by univariate relationships with outcomes. Thus, these results should be considered exploratory to determine factors that might be considered in the design of future studies.

In conclusion, more than half of patients who were admitted to the ED of a large county medical center due to SDV had not received outpatient psychosocial or psychiatric services in the previous six months and almost a third had not received psychotropic medications despite severe symptoms and impaired functioning. While our hypothesis that multiple episodes of self-directed violence would predict more utilization was largely supported, a number of key services were no more likely or frequent. This is one of the only studies of usual care services for suicidal individuals admitted to the ED and helps to illuminate areas

that need to be improved to prevent suicide. Further research is clearly needed to determine the generalizability of these findings to other subgroups of suicidal individuals.

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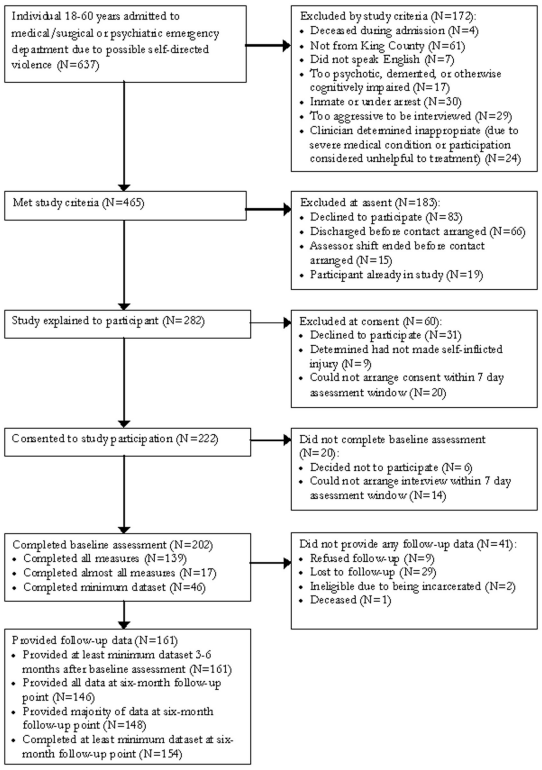

Figure 1. Flowchart of Study Recruitment and Completion

Table 1
Demographic and Clinical Characteristics

	Full Sample	Single SDV episode	Multiple SDV episodes	Odds Ratio[a] (95% CI)
N (% of Total)	202 (100.0)	109 (54.0)	93 (46.0)	
% Male	105 (52.0)	56 (51.4)	49 (52.7)	1.05 (0.61-1.82)
Age				
Mean (Standard Deviation)	36.4 (10.6)	38.2 (10.4)	34.4 (10.4)	**0.97 (0.94-0.99)**[1]
Racial Ethnicity				
%Caucasian	143 (70.8)	78 (71.6)	65 (69.9)	Ref
%African-American	21 (10.4)	11 (10.1)	10 (10.8)	1.08 (0.45-2.63)
%Asian	4 (2.0)	0 (0.0)	4 (4.3)	12.93 (0.67-248.11)
%Native American	5 (2.5)	4 (3.7)	1 (1.1)	0.39 (0.06-2.43)
%Latino/a	5 (2.5)	3 (2.8)	2 (2.2)	0.83 (0.16-4.23)
%Other (primarily multiracial)	24 (11.9)	13 (11.9)	11 (11.8)	1.01 (0.44-2.35)
Marital Status				
% Single, never married	104 (51.7)	46 (42.6)	58 (62.4)	Ref
% Widowed	5 (2.5)	3 (2.8)	2 (2.2)	0.61 (0.12-3.11)
% Separated	20 (10.0)	13 (12.0)	7 (7.5)	0.46 (0.18-1.20)
% Divorced	41 (20.4)	22 (20.4)	19 (20.4)	0.71 (0.35-1.45)
% Married	31 (15.4)	24 (22.2)	7 (7.5)	**0.25 (0.10-0.62)**
Educational level				
% Some high school/GED not completed	28 (14.3)	16 (15.1)	12 (13.3)	Ref
% High school diploma or GED	61 (31.1)	26 (24.5)	35 (38.9)	1.77 (0.75-4.15)
% Some college or business/technical training	79 (40.3)	45 (42.5)	34 (37.8)	1.00 (0.44-2.28)
% College graduate and beyond	28 (14.3)	19 (17.9)	9 (10.0)	0.64 (0.37-1.79)
Income in past year				
% Making less than $10,000	80 (58.4)	40 (51.3)	40 (67.8)	Ref
% Making $10,000 - $24,999	30 (21.9)	22 (28.2)	8 (13.6)	**0.39 (0.16-0.94)**
% Making $25,000 - $49,999	18 (13.1)	9 (11.5)	9 (15.3)	1.02 (0.38-2.73)
% Making $50,000 and higher	9 (4.5)	7 (9.0)	2 (2.2)	0.35 (0.08-1.48)
% Homeless	50 (24.8)	20 (18.3)	30 (32.3)	**2.07 (1.09-3.93)**
Lifetime suicide attempts				
Median (IQR[2])	2 (0-7)	1 (0-3)	6 (3-16)	**3.42 (2.30-5.10)**[3]
Lifetime non-suicidal **SDV**				
Any N (%)	76 (46%)	28 (30%)	48 (66%)	

	Full Sample	Single SDV episode	Multiple SDV episodes	Odds Ratio[a] (95% CI)
If any, Median (IQR)	11 (3-68)	4 (1-30)	23 (7-117)	**1.66 (1.35-2.05)**[2]
Psychiatric Conditions[4]	N (%)	N (%)	N (%)	
% Major depressive **episode**	118 (80.8)	67 (79.8)	51 (82.3)	
% Dysthymia	40 (27.6)	18 (21.4)	22 (36.1)	
% Manic episode	14 (9.7)	4 (4.8)	10 (16.4)	
% Hypomanic episode	2 (1.4)	1 (1.2)	1 (1.6)	
% Panic disorder	28 (19.3)	13 (15.5)	15 (24.6)	
% Agoraphobia	61 (42.4)	32 (38.1)	29 (48.3)	
% Social phobia	36 (25.0)	18 (21.4)	18 (30.0)	
% OCD	31 (21.5)	15 (17.9)	16 (26.7)	
% PTSD	38 (26.8)	21 (25.0)	17 (29.3)	
% Alcohol dependence	61 (40.4)	36 (40.9)	25 (39.7)	
% Alcohol abuse	12 (7.9)	7 (8.0)	5 (7.9)	
% Substance dependence	48 (31.6)	23 (25.8)	25 (39.7)	
% Substance abuse	11 (7.2)	9 (10.1)	2 (3.2)	
% Psychotic symptoms	43 (30.1)	18 (21.4)	25 (42.4)	
% Anorexia nervosa	0 (0.0)	0 (0.0)	0 (0.0)	
% Bulimia nervosa	8 (5.6)	3 (3.6)	5 (8.3)	
% Generalized anxiety	57 (39.6)	35 (41.7)	22 (36.7)	
% Any Affective **Episode**[5]	130 (90.9)	74 (89.2)	56 (93.3)	1.61 (0.51-5.11)
% Any Anxiety Disorder[6]	114 (80.3)	64 (76.2)	50 (86.2)	1.88 (0.79-4.47)
% Substance Use Disorder[7]	92 (60.9)	52 (59.1)	40 (63.5)	0.84 (0.43-1.61)
% Anti-social personality	34 (23.8)	16 (19.0)	18 (30.5)	1.81 (0.85-3.88)
% Borderline personality	41 (29.3)	20 (24.7)	21 (35.6)	1.65 (0.80-3.39)
Symptom Scales[8]	Mean (SD)	Mean (SD)	Mean (SD)	
Brief Symptom Inventory				
Global Severity Index	2.12 (.69)	1.94 (.71)	2.34 (.60)	**2.48 (1.47-4.20)**
SF-12[9]				
Physical Component Score	48.61 (11.55)	48.36 (11.25)	48.93 (12.01)	1.00 (0.98-1.03)
Mental Component Score	27.45 (10.72)	28.75 (11.98)	25.77 (8.63)	0.97 (0.94-1.01)

[a] Bayesian logistic regression of predictors on the outcome of single vs. multiple SII episodes

[1] Boldface type indicates statistically significant result

[2] Interquartile Range

[3] Outliers included in the analysis presented. Results excluding outliers comparable.

[4] Diagnoses and conditions are current (past month) except substance abuse which his past 12 months and personality disorders which are lifetime; N=146 for diagnostic data as 56 participants did not complete the entire interview due to lack of time, fatigue, or because they were a poor historian. Representativeness analysis did not show differences in demographic or SII data between those with and without diagnostic data

[5] Any affective episode included major depression, bipolar disorder, and dysthymia

[6] Any anxiety disorders included panic, agoraphobia without panic, social phobia, obsessive-compulsive disorder, and post-traumatic stress disorder.

[7] Substance use disorder included any type of substance including alcohol and abuse as well as dependence

[8] N=146 for symptom scales data as 56 participants did not complete the entire interview because of lack of time or fatigue.

[9] Lower scores are more severe on the SF-12

Table 2

Inpatient and Crisis Services Received in the Six Months Prior to ED Admission

	Full Sample		Single SII episode		Multiple SII episodes		Odds Ratio (95% CI)
	Any N (%)	If any, Median (IQR[1])	Any N (%)	If any, Median (IQR)	Any N (%)	If any, Median (IQR)	
	198[2] (100.0)		107 (54.0)		91 (46.0)		
Inpatient Treatment							
Medical/surgical inpatient admission	10 (5%)	1 (1-1)	2 (2%)	1 (1-1)	8 (9%)	1 (1-2)	**1.07 (1.01-1.14)**[a]
Psychiatric inpatient	52 (26%)	1 (1-2)	10 (9%)	1 (1-2)	42 (46%)	1 (1-2)	**6.15 (3.24-11.67)**[b]
Voluntary admission	48 (24%)	1 (1-2)	10 (9%)	1 (1-1)	38 (41%)	1 (1-2)	
Involuntary admission	16 (8%)	1 (1-1)	3 (3%)	1 (1-1)	13 (14%)	1 (1-1)	
Residential chemical dependency treatment	18 (9%)	1 (1-1)	8 (8%)	1 (1-1)	10 (11%)	1 (1-2)	1.03 (0.96-1.12)[a]
Crisis Services							
Emergency Department	88 (44%)	1 (1-3)	22 (21%)	1 (1-2)	66 (73%)	2 (1-3)	**4.22(2.67-6.65)**[b]
Paramedics responded	55 (28%)	1 (1-3)	13 (12%)	1 (1-3)	42 (46%)	1 (1-3)	**1.40 (1.25-1.58)**[a]
Police made wellness check	15 (8%)	1 (1-2)	4 (4%)	2 (1-2)	11 (12%)	1 (1-2)	**1.09 (1.01-1.17)**[a]
Evaluated for involuntary admission	22 (11%)	1 (1-2)	4 (4%)	2 (1-2)	18 (20%)	2 (1-2)	**1.17 (1.08-1.28)**[a]
Detox	21 (11%)	1 (1-1)	6 (5.6%)	1 (1-2)	15 (17%)	1 (1-1)	**1.14 (1.04-1.24)**[a]
Contacted a Crisis Line	31 (16%)	2 (1-6)	10 (9%)	2 (2-5)	21 (23%)	1 (1-7)	**1.14 (1.04-1.26)**[a]

[a] Bayesian logistic regression of whether low base rate service occurred or not predicted by single vs. multiple SII episodes

[b] Negative binomial regression of rate of service utilization predicted by single vs. multiple SII episodes

[1] Interquartile Range

[2] Three participants did not complete the interview due to discharge or other interference and one participant refused this part of the interview

Table 3

Medical Visits and Pharmacotherapy Received in the Six Months Prior to ED Admission

	Full Sample		Single SII episode		Multiple SII episodes		Odds Ratio (95% CI)
	Any N (%)	**If any, Median (IQR[1])**	**Any N (%)**	**If any, Median (IQR)**	**Any N (%)**	**If any, Median (IQR)**	
	198[2] (100.0)		107 (54.0)		91 (46.0)		
Pharmacotherapy Services[3]							
Had behavioral health related medical visit	80 (41.2%)	3 (1.3-6)	42 (40%)	4 (1.8-6)	38 (42.7%)	2 (1-5)	1.05 (0.60 -1.83)[b]
N (% of Total)	155 (100.0)[4]		84 (54.0)		71 (46.0)		
Received psychotropic medication	107 (69.5%)	2 (1-4)	51 (60.7%)	2 (1-3)	56 (80%)	3 (2-4)	**1.63 (1.20-2.22)[b]**
Prescribed psychotropic medication and never filled prescription	25 (16.2%)	1 (1-2)	10 (11.9%)	1 (1-2.8)	15 (21.4%)	1 (1-2)	1.10 (0.98-1.23)[a]
Received non-psychotropic medication	84 (54.2%)	2 (1-2)	43 (51.2%)	2 (1-2)	41 (57.7%)	2 (1-2)	1.06 (0.68-1.64)[b]
Took complimentary/ alternative medication	17 (11%)	0 (0-0)	10 (12%)	0 (0-0)	7 (10%)	0 (0-0)	0.98 (0.89-1.08)[a]

[a] Bayesian logistic regression of whether low base rate service occurred or not predicted by single vs. multiple SII episodes

[b] Negative binomial regression of rate of service utilization predicted by single vs. multiple SII episodes

[1] Interquartile Range

[2] Three participants did not complete the interview due to discharge or other interference and one participant refused this part of the interview

[3] Note that 2 participants did not know which services they had and 6 did not complete this section of the interview.

[4] Note that 39 participants did not complete this section of the interview

Table 4

Psychosocial Outpatient Interventions Received in the Six Months Prior to Emergency Department Admission

	Full Sample	Single SII episode	Multiple SII episodes	OR (95% CI) / RR (95% CI)
N (% of Total)	174 (100.0)	99 (56.9)	75 (43.1)	
Outpatient psychosocial visits				**Zero: 2.38 (1.28- 4.43)**[c] Count: 0.97 (0.88-1.06)
% None	90 (51.7)	61 (61.6)	29 (38.7)	
% 1-5 visits	12 (6.9)	3 (3.0)	9 (12.0)	
% 6-11 visits	6 (3.4)	5 (5.1)	1 (1.3)	
% 12 or more visits	66 (37.9)	30 (30.3)	36 (48.0)	
Persons receiving at least one visit of following services[1] N (%)				
Individual therapy	61 (30.0)	29 (26.6)	32 (34.4)	1.08 (0.95-1.23)[a]
Group therapy	19 (9.4)	6 (5.5)	13 (14.0)	1.09 (1-1.18)[a]
Case management	50 (24.8)	16 (14.7)	34 (36.6)	**1.24 (1.11-1.40)**[a]
Substance abuse treatment program	20 (9.9)	9 (8.3)	11 (11.8)	1.04 (0.95-1.13)[a]
Twelve-step program	36 (22.8)	16 (18.2)	20 (28.6)	1.11 (0.97-1.26)[a]
Satisfaction with provider (0=not at all to 5=very helpful)	Mean (SD) 3.95 (1.26)	Mean (SD) 4.03 (1.27)	Mean (SD) 3.88 (1.27)	0.85 (0.60-1.21)[a]

[a] Bayesian logistic regression of whether low base rate service occurred or not predicted by single vs. multiple SII episodes

[b] Hurdle model with negative binomial regression of rate of service utilization predicted by single vs. multiple SII episodes

[1] Services received by less than 5% of the participants are excluded. These included couple or family counseling, spiritual counseling, free standing skills training class, vocational training, and intake assessment alone.